Development of Verbal HITS for Intimate Partner Violence Screening in Family Medicine

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BACKGROUND AND OBJECTIVES: Researchers in intimate partner violence (IPV) screening have developed a short written tool called HITS. The acronym corresponds to questions that elicit information about how often a woman’s male partner physically hurts, insults, threatens harm, and screams at her. The purpose of this study was to develop a verbal form of the HITS and to compare it to the published written version.

METHODS: A secondary analysis of data from prior HITS research was conducted. From this, the screening questions were modified for oral presentation so that patients could respond with a yes or no answer. To test the comparability of the two screening formats, 103 adult female patients completed both forms of the HITS during routine office visits. Phase one of this study used Optimal Data Analysis (ODA) on 210 cases from prior HITS research to create a cut score that differentiates clinic patients from self-identified victims of abuse. From this, written HITS questions were modified for verbal administration. Phase two of this study used t test, ANOVA, and classification of two screening formats to compare the written and verbal HITS administered to 103 adult female family medicine patients.

RESULTS: Responses to both types of screening were related. The mean score on the written HITS was statistically higher for respondents who reported “yes” to a Verbal HITS question. This was consistent across all four questions. Also, the mean written HITS score increased linearly as a function of the number of yes answers on the Verbal HITS. The screening classification (positive, negative) from both forms of the HITS was the same for 83% of the respondents.

CONCLUSIONS: The verbal and written HITS comprise two ways that clinicians can screen for domestic violence.

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IPV to category B.

Under the new recommendation, clinicians are advised to screen all women of childbearing age for IPV and provide services (referral or intervention) for those who screen positive. This new recommendation, along with provisions in the Affordable Care Act that require insurance coverage for screening and counseling at no extra costs to women, put forth a call to action for health care professionals to take a more active role in recognizing and preventing IPV.

Despite the new recommendation, screening for IPV by health care professionals may still be done infrequently for a variety of reasons. Potential barriers to recognition of IPV include lack of knowledge and experiential training, time constraints associated with daily practice, and general discomfort. Specifically, a physician’s lack of knowledge of short, time-efficient, validated IPV identification tools can decrease IPV screening. Several standardized screening instruments are available for outpatient settings, such as the 40-item Wife Abuse Inventory and the Conflict Tactics Scale. However, these lengthy questionnaires are primarily used for research purposes and not universally intended to be a screening tool to be used in a busy practice. They are very time consuming for physicians to administer and for patients to complete. Hence, health care professionals may be deterred from using these tools in busy clinical settings. In addition, these instruments are not well known among clinicians.

Shorter screening scales have also been developed, such as the Partner Violence Screen (PVS), Wom­an Abuse Screening Tool (WAST), and Women Abuse Screening Tool Short Form (WAST-SF). These instruments lack high sensitivities and specificities when validated with longer standardized instruments and may inconsistently identify patients affected by IPV.

In response to these issues, we previously developed and tested a four-item domestic violence screening tool, known by the acronym HITS. The written form of the HITS asks patients: “How often does your partner: physically hurt you, insult you or talk down to you, threaten you with harm, and scream or curse at you?” Sherin and colleagues were able to differentiate family medicine patients from self-identified abuse victims by a cut point using the total HITS score, which is formed by summing responses to all four screening questions. When validated against the Conflict Tactics Scale, the HITS yields a high sensitivity and specificity for female populations (96% sensitivity, 91% specificity). Later, Shakil and colleagues validated the HITS for use in males (88% sensitivity, 97% specificity) populations. This short paper-and-pencil questionnaire demonstrated excellent reliability and validity and has been utilized in several clinical settings in the self-administered and clinician interview format. The HITS has been translated in Spanish, Arabic, and Chinese languages and has been validated with both females and males in family medicine settings. Nevertheless, the time constraints placed on family physicians may still hinder their ability to use a paper and pencil screening tool during regular office visits.

The present study was designed to extend this work by developing a verbal form of the HITS so that busy physicians could more easily screen for IPV. To achieve this, a secondary analysis of data from our development of the written version of the HITS was conducted to guide the preparation of a verbal form of the tool. Following this, new data were collected to establish the correlation of the verbal and written forms of the HITS among a sample of family medicine outpatient practices.

Methods

Overview

This study was conducted in two phases. The purpose of phase one was to guide the development of a HITS screening tool that could be administered orally for convenience in the clinical setting. A secondary analysis of data from previous research on the written HITS was conducted. Responses are made on a 5-point frequency format: never, rarely, sometimes, fairly often, and frequently.

To do this, we needed to discover if patients and victims from the Sherin et al study could be statistically differentiated by a cut score on answers to each of the four HITS questions. ODA was used to determine a cut score to differentiate clinic patients from self-identified victims of abuse. We subsequently constructed a verbal form of the HITS by framing questions in terms of a frequency, determined by the location of the cut scores, so that patients could respond with a simple “yes” or “no” answer. The resulting set of questions was called the Verbal HITS. Details about this are presented below.

In phase two of the study, the comparability of the verbal and written forms of the HITS was assessed with a group of volunteer female patients who completed both screening formats during an office visit. It was expected that responses to both forms of the HITS would be significantly and strongly associated using three analyses detailed below. For phase two (comparing verbal and written forms of the HITS), 103 female patients visiting a family physician participated in the study. Approval for this project was granted by the institutional review board (IRB) committees of the University of Illinois at Chicago and Advocate Christ Hospital, where the authors were at the time of data collection.

Population

For phase one of the study (using ODA to determine cut scores), 210 cases from the Sherin et al study were used in this study. These included 160 female family medicine clinic patients and 50 women self-identified as IPV victims. For inclusion, participants had to be at least 21 years of age and had to have lived with the same partner for at least 12 months. All participants who were
not self-identified as victims of IPV were recruited from one ambulatory care clinic, the Family Medicine Center of Advocate Christ Hospital and Medical Center. This clinic serves a population of urban/suburban patients in the southwest Chicago area of Oak Lawn. Self-identified victims of IPV were recruited from the emergency room and one IPV crisis shelter. During the data collection period, 185 women were approached for participation in the study. Of that total, 82 did not meet the study inclusion criteria or refused to participate.

For phase two (comparing the written and verbal forms of the HITS), 103 female patients visiting the Family Medicine Center of Advocate Christ Hospital and Medical Center during May through August 2002 participated in the study. The inclusion criteria were the same as in phase one. A total of 185 women were approached for participation in the study, but 82 did not meet the inclusion criteria or refused to participate. The age range of participants was 21 to 73, with a mean and standard deviation of 35.58 and 10.68, respectively. Sixty-six percent (n=68) were Caucasian, and the majority (90%, n=93) were not pregnant.

**Instruments**

**Written HITS.** This instrument as described above is scored by summing responses to all of the questions. Scores can range from a minimum of 4 to a maximum of 20. The original research by Sherin et al\(^{15}\) showed that the written HITS has good internal consistency, good concurrent validity with the Conflict Tactics Scale,\(^{11}\) and good construct validity.

**Verbal HITS.** The ODA of the Sherin et al\(^{15}\) data led to the following structure of the Verbal HITS: “Does your partner: physically hurt you, insult you or talk down to you fairly often, threaten you with harm, and scream or curse at you fairly often?” One should note that the fundamental characteristic of the Verbal HITS is that questions are posed with the phrase “Does your partner …” as opposed to “How often does your partner…” Hence, the Verbal HITS items foster a dichotomous yes or no answer because a frequency is implied or stated in the question. These four screening questions were presented to patients verbally by the physician who recorded the answers.

**Instrument Administration.** Both forms of the HITS were presented to patients during an office visit. To control for presentation effects, the sequencing of the formats was counterbalanced. In other words, half of the participants completed the written HITS followed by the Verbal HITS, whereas the other half did this in reverse.

**Data Analysis**

**Phase One: ODA of HITS Data from Sherin et al.** Screening data from 210 cases from the Sherin et al\(^{15}\) study were analyzed using ODA (ODA 1.0, Optimal Data Analysis for DOS, Chicago, Optimal Data Analysis, Inc) to find a cut score that reliably differentiated a sample of clinic patients (n=160) from self-identified victims of abuse (n=50) on each of the HITS questions.

To evaluate each of the cut scores, a leave-one-out validation method was used. This method proceeds by holding out a single score while the others are used to derive the cut score. This cut score is then used to classify the holdout score as belonging to a patient or an abuse victim. After this is done for all 210 cases, the results are merged to examine the overall percentage accuracy classification. The leave-one-out methodology allowed us to classify a respondent whose screening datum was not used to derive the cut score, thus rendering a less biased classification accuracy. The sensitivity and specificity of all four cut scores were computed.

**Phase Two: Comparability of HITS Screening Formats.** To determine the relationship of the responses to both forms of the HITS, three statistical analyses were conducted. In the first, the mean score of the written HITS was compared for those who said “yes” with those who said “no” on each of the Verbal HITS items. Student’s \(t\) test for independent samples was used for these comparisons. If the two screening formats measure similar information, it was believed that the mean written HITS score would be greater for those who said “yes” on any one of the Verbal HITS items.

In the second analysis, the mean written HITS score was examined as a function of the number of verbal items in which the respondent gave a “yes” answer. Given that there were four verbal items, respondents could have answered “yes” on 0, one, two, three, or four of those items. We called this the verbal item count. The association of the written HITS score and the verbal item count was tested with a one-way analysis of variance (ANOVA). If the two forms of HITS screening are related, it was believed that the mean written HITS score would increase as the verbal item count increased.

In the third analysis, the classification of the verbal HITS score (ie, positive or negative) was examined in terms of the classification of the written HITS score. In line with the ODA analysis conducted in Phase one of this study, patients were classified as positive on the Verbal HITS if they answered “yes” to any one of the four items. Answering “no” to all of the items classified them as a negative screen.

Previous work by Sherin et al\(^{15}\) found that a score of 10.5 on the written HITS differentiated self-identified abuse victims from routine clinic patients. Hence, scores greater than 10 lead the clinician to classify a patient as a possible victim of abuse. A 2 X 2 contingency table was constructed that cross referenced the
Verbal HITS classification (negative or positive) with the written HITS classification (negative with a score <10 or positive with a score >10).

Presentation Effects. Tests for presentation effects were conducted by comparing responses for participants who completed an instrument first with those who completed it second. Student’s t test for independent samples was used for the written HITS score. The Pearson chi-square test was used for the Verbal HITS given the discrete nature of the response format.

Missing Values. There was only one person who had two missing items on the written HITS. That person was dropped from the analysis. Therefore, the final number for analyses was 102.

Results

Phase One: Secondary Analysis of HITS Data From Sherin et al

Table 1 displays the cut scores that were found for the four written HITS questions from the Sherin et al study. A statistically significant cut score was found for each item (all Ps<.01275). As one can see, the cut scores for the physical abuse items (ie, physically hurt and threaten with harm) were as low as possible on the 5-point frequency scale. In other words, abuse victims were reliably distinguished from office patients by the former reporting the occurrence of physical violence at any level of frequency (ie, rarely to frequently).

Table 1 also shows that the two groups of respondents could be differentiated by cut scores on the verbal abuse items. However, the frequency of the assault was important. Abused victims tended to report that they were insulted sometimes or more often. They also reported that their partner screamed or cursed at them fairly often or frequently.

The results of this secondary analysis suggested that the physical abuse items on the Verbal HITS could be stated without explicit reference to a frequency. For example, the question “Does your partner physically hurt you?” implies that one is asking if physical abuse occurs at any level of frequency. The verbal abuse items, however, needed to be qualified. Although the cut scores for the two verbal abuse items in Table 1 were different, we decided to use one level of frequency for each question on the Verbal HITS. The options were “sometimes” and “fairly often.” We settled on the latter because the term reflects an occurrence of some regularity. It was believed that using the same frequency for both verbal abuse items would make it easier for clinicians to remember. Table 2 shows the four verbal HITS items and the criterion for classifying a positive and negative screen.

Phase Two: Comparability of HITS Screening Formats

In Table 3, it can be seen that the mean written HITS scores were statistically higher for respondents who said “yes” on each of the Verbal HITS items. The mean written HITS scores for the patients who said “yes” to 0, one, two, three, and four verbal items were 4.58, 6.90, 7.57, 12.00, and 15.67, respectively. A one-way ANOVA revealed a statistical difference among the means, F (4, 97)=71.93, P<.0005. Moreover, the difference was found to have a linear trend, F (1,97)=271.56, P<.0005.

The strength of the linear relationship between the verbal item count and written HITS score was strong, χ² = .84 (χ² is a measure of association similar to the Pearson r). This means that 71% of the variance in written HITS scores (ie, χ²) was attributable to the verbal item count.

Table 4 shows the classification of the Verbal HITS screen as a function of the same by the written HITS score. Overall, the screening classification (positive or negative) was the same for 83% of the patients (85/102). Table 4 shows that the written HITS classified five patients as positive, all of whom were classified as such by the Verbal HITS. This is similar to a 100% sensitivity. Moreover, the written HITS classified 97 patients as negative, 80 of whom

Table 1: Cut Scores for Each of the Verbal HITS items* From the Original Research by Sherin et al

<table>
<thead>
<tr>
<th>Item</th>
<th>Cut Score</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physically hurt you?</td>
<td>1.5</td>
<td>100</td>
<td>93</td>
</tr>
<tr>
<td>Insult you or talk down to you?</td>
<td>2.5</td>
<td>96</td>
<td>73</td>
</tr>
<tr>
<td>Threaten you with harm?</td>
<td>1.5</td>
<td>88</td>
<td>91</td>
</tr>
<tr>
<td>Scream or curse at you?</td>
<td>3.5</td>
<td>82</td>
<td>91</td>
</tr>
</tbody>
</table>

* Responses to the verbal HITS are scored in the following way: 1=Never, 2=Rarely, 3=Sometimes, 4=Fairly Often, 5=Frequently. For each item, P<.01275.

Table 2: The Verbal HITS Screening Questions

1. Does your partner physically hurt you?
2. Does he insult you or talk down to you fairly often?
3. Does he threaten you with harm?
4. Does he scream or curse at you fairly often?

* The patient answers “yes” or “no” to each question. A “yes” to one or more questions classifies the patient as a positive screen. Answering “no” to all of the items renders a negative screen. The items can be remembered by the acronym HITS.
were classified as such by the Verbal HITS. This is similar to an 82% specificity.

**Presentation Effects**
Presentation effects were not found. The mean written HITS score was 5.19 for those who completed the instrument first and 5.93 for those who completed it second, \( t = 1.31, P = .193 \). The distribution of the verbal item count (ie, 0, one, two, three, four) was similar for those who completed the Verbal HITS first and second, \( \chi^2(4) = 3.44, P = .487 \).

**Discussion**
The HITS instrument is not the first short domestic violence screening tool to be developed for an outpatient clinical setting, ie, Woman Abuse Screening Tool (WAST).\(^{13}\) was developed for the same purpose. The HITS, however, is the shortest and the only instrument available in both written as well as verbal versions. Research has produced mixed results on women’s preferences for verbal questioning or self-administered screening measurements\(^{20}\) and the validation of the verbal HITS allows for health care providers to adapt their method based on women’s preferences. Moreover, it has the highest sensitivities and specificities when compared to other validated instruments.\(^{14}\) An important feature of the HITS is that it constitutes a mnemonic for training purposes to help busy health care providers recall pertinent items and ask specific questions about IPV even if a written instrument is not available. Research has shown that training medical students using a mnemonic tool is an effective teaching method to improving their interviewing skills for IPV.\(^{21}\)

The internal consistency of the HITS and its construct validity have already been established, and it has been validated in males\(^{16}\) and translated in other languages.\(^{17-19}\) In the future, the HITS can be extended and compared with other normed instruments, such as the Index of Spouse Abuse.\(^{22}\) Chan and colleagues

<table>
<thead>
<tr>
<th>Item and Response</th>
<th>n</th>
<th>HITS Score</th>
<th>t</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does your partner . .</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physically hurt you?</td>
<td>Yes</td>
<td>3</td>
<td>15.67</td>
<td>9.38</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>99</td>
<td>5.17</td>
<td></td>
</tr>
<tr>
<td>Insult you or talk down to you fairly often?</td>
<td>Yes</td>
<td>19</td>
<td>9.16</td>
<td>5.07</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>83</td>
<td>4.64</td>
<td></td>
</tr>
<tr>
<td>Threaten you with harm?</td>
<td>Yes</td>
<td>5</td>
<td>14.20</td>
<td>5.84</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>97</td>
<td>5.03</td>
<td></td>
</tr>
<tr>
<td>Scream or curse at you fairly often?</td>
<td>Yes</td>
<td>15</td>
<td>9.53</td>
<td>4.34</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>87</td>
<td>4.78</td>
<td></td>
</tr>
</tbody>
</table>

Table 4: The Classification of the Verbal HITS* Screen as a Function of Patients’ Classification by the Written HITS Score

<table>
<thead>
<tr>
<th>Verbal HITS</th>
<th>Written HITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>≤10</td>
</tr>
<tr>
<td></td>
<td>(Negative)</td>
</tr>
<tr>
<td>Negative</td>
<td>80 (82%)</td>
</tr>
<tr>
<td>Positive</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>97</td>
</tr>
</tbody>
</table>

* On the Verbal HITS, patients are classified as positive if they answer “yes” to any one of the four items. Answering “no” to all of the items renders a negative screen.
validated the “Extended—Hurt, Insult, Threaten, Scream (E-HITS)” tool, which included an additional question to examine sexual violence in Hong Kong. The additional question, “Has your partner ever forced you to have sexual activities?” should be validated in English with both verbal and written versions. Further, the verbal version of the HITS should be validated in the male population to make it a universal tool for IPV. HITS scores could be correlated with the documentation of domestic violence in medical records and be tested with other high-risk patient populations.

The use of standardized screening protocols can effectively increase the recognition of IPV in a variety of settings. We hope that the HITS tools, both verbal and written versions, will add to the existing repertoire of tools for improving surveillance and recognition of this critical problem in the medical setting. This verbal version of HITS should further facilitate this process, yet further testing is still needed.

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Author Disclosure: Dr Sherin is chair of the American College of Preventive Medicine ACPM Practice Committee.

Ms Kindratt is public director at large for the National Commission on Certification of Physician Assistants Board of Directors.

In addition to using the Verbal HITS as a quick intimate partner violence (IPV) screen, the original validated HITS questions are available to health care providers by the R3 App. The mobile application was developed by Harbor House of Central Florida for the Project Courage Initiative. Medical professionals are able to quickly assess IPV victims and make appropriate referrals. More information can be found at http://www.harborhouseof.com/201201/r3-app-2/ or by downloading the R3 App for their smart phone.

References


